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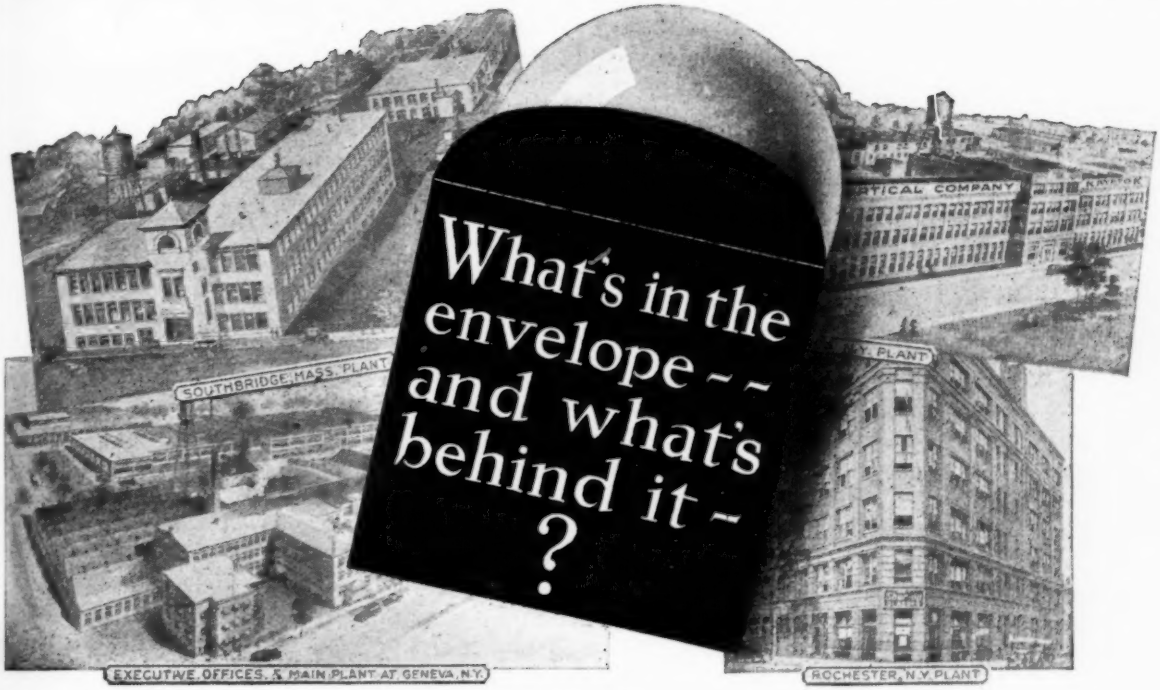
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AMERICAN JOURNAL OF OPTOMETRY

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OPTICAL INSTRUMENTS AND RESEARCH*

A. J. Esdaile, F.B.O.A.

Newport, England.

The Chairman said he was sure that on such an afternoon as that they would not expect him to waste much time in introducing the lecturer, but he felt that it was necessary to say a word or two with regard to the general problem of research work. Recently, he was reading an article in which the writer was complaining that now both the North Pole and the South Pole had been discovered there was no further use for the explorer, but he could assure that gentleman that exploration was only commencing in very many departments of life, and with regard to ophthalmic optics, though the explorers were young, and the territory was largely uncharted, yet at the same time they were going forward full of confidence that their work would be productive of results which would be useful to humanity. Now, with regard to ophthalmic opticians they could really divide their research work into three departments, and a supplementary department. The first great field which they had to cover was the political field. They as opticians were striving to do work which was useful to the community, and they would remember that the first piece of real co-ordinated forward research work which they issued as an Institute was the evidence which they gave before the Royal Commission, and for that they had very largely to thank Mr. Gregg for collecting the data for him to work upon. Then the next department of research was the professional side of their work. Every day they, as practising opticians, knew they were meeting with cases which they had to correct, and yet at the same time they knew there were certain elements in them which were almost undiscovered territory, and they had to work on empirical lines, and it was on that particular department that Mr. Esdaile had come right from the West of England to address them that afternoon. Then, further, there was the technical side of their work. They were feeling that their apparatus—that the lenses they used, that the frames they used—was needing further perfection, because, as professional work developed, the technical side must develop equally well. In order to cope with that field of research work they had started a Research Committee of the Institute, and they hoped to co-operate with other optical bodies, so that ophthalmic research work could be pushed forward with increased energy and increased co-operation. But there was one other field along which they would have to pursue their research, and that was in finding out sources for raising money, because every aspect of scientific work necessarily had a financial basis. They knew that the interest which was being taken would bring forward great responsibilities on the financial side, and he felt that they could not have too much publicity with regard to their needs in that direction. Now, it was significant that opticians were largely awake to their financial needs when he said that when this question of research work was first brought forward at the last conference a gentleman came up and said: "Mr. Aves, I think the work you propose is so important that I shall have very great pleasure in giving you fifty guineas towards it." That gentleman was none other than the Chairman of the Hampshire Association (Applause). The next day another gentleman rang him up and said: "With regard to that research work. I was going to give you a donation for something else, but I think this is much more important. Put me down for twenty-five guineas." And then two or three days after that another firm also promised twenty-five guineas, so that within a few days they had one hundred guineas subscribed towards a research fund from three firms out of the two or three thousand firms in existence.

"Please don't be frightened," Mr.

Aves urged, "by the word research." One man was collecting statistics of all the weavers' and menders' eyesight in Yorkshire. He had a number of men who were getting him information with regard to the effect of a particular branch of work in industry. That was research work. Another man was busy finding out the connection between astigmatism and various other defects and muscular imbalance. That was very important research work. It did not mean that they must attend a laboratory or a university to do research work. Research meant merely exploration, and from the present records of opticians and all their daily work an infinite variety of problems could be solved. He would say no more, but would briefly introduce their lecturer, Mr. Esdaile. In fact, he thought they might regard Mr. Esdaile as one of the pioneers of modern research work amongst ophthalmic opticians. He had come to them to speak about the problems of muscular imbalance, and with regard to the designing of new instruments, and he had the greatest pleasure in inviting Mr. Esdaile to address them.

The lecturer said:

The science of optics is divided by a sharp line. On one side is Pathology, on the other Physics. It must be clearly understood that the Physical side only is being dealt with this afternoon and that it is within this field all our remarks will be confined.

In using the term research its very wide application is conceded. The two instruments before you occupy a very small area in the wide field waiting to be tilled (I hope, by opticians in general and by this Society in particular.) Both the Myophoriagraph and the Retinoscope are the results of observations in the test room. They serve in particular one phase of the routine in sight testing, that of phoria, and it was the desire to prove something which, while already accepted in theory, had never been demonstrated, gradually led on to the designing and making of these two instruments.

Re-correction.

Re-correction has always been a bugbear to us. Dr. R. M. Peckham, of Waterbury, Conn., U. S. A., in an address delivered in America, puts this into words in a far better way than I possibly could. I will read the extract dealing with the subject of re-correction, which is as follows:

"I used to wonder why I had so many re-corrections, and I used to worry as to why I lost so many patients. And why did so many people come to me after having visited other optometrists and oculists, complaining that their glasses were uncomfortable, that their eyes pained when they attempted to use those glasses? I get a lot of patients from other men and so do you. And other men get many of my patients, and your competitors get many of yours. We are always getting cases that some other man has failed to make comfortable. There are people going from place to place, spending time and money looking for relief, and suffering continual disappointment. For some reason it is easier to analyze others' errors than to recognize our own, and, also, for some strange reason, there is more incentive in trying to discover another man's mistakes than there is to look for our own. In working over the cases that came to me from other refractionists I came to the realization that they had failed to give sufficient attention to muscular conditions and that their corrections had not given binocular balance. If this were their trouble, it must be my own, and I realized that I must give more attention to this detail. I took out my old text books and re-read the chapters on muscles and muscle testing. There was nothing there that I was omitting in my regular routine, so there must be something that these writers had not covered. So I bought more books, but all I found were words, words, words. There was every evidence that the writers themselves knew little of what they were attempting to write about, and were covering their ignorance in a multiplicity of high-sounding but meaningless series of technical phrases.

Then I realized that the old rule, 'Always give the strongest plus or the weakest minus,' was but a snare and delusion, conceived and followed in ignorance of the laws and mechanics of binocular vision." Thus Dr. Peckham.

The Myophoriagraph.

The studies which preceded the idea of the Myophoriagraph extended over

a number of years, the drawings and plans were got out and the first instrument (which you see before you) was made about twelve months prior to the delivery by Dr. Peckham of his lecture. This is not said with the slightest wish to impress you with being the first in the field, but in the sense that it certainly is gratifying to know that a gentleman of the attainments of Dr. Peckham has for a long time been thinking along the same line of research as one's self, and arriving at very much the same conclusions.

His deductions are singularly akin to my own, and I should like to take this opportunity of expressing the keenest appreciation of the manner in which he has handled his subject of Muscular Balance, and of saying how helpful his papers have been to me in the way of corroboration.

It will, perhaps, be useful to make the statement here that I am persuaded that the ultimate effect of the use of the Myophoriagraph will be not only to prove all Dr. Peckham's and my own deductions and conclusions to be absolutely correct, but it will demonstrate their correctness by graph. The Retinoscope also provides conclusive data in muscle balances which will be invaluable and a decided step forward in research. For instance, the latter instrument establishes beyond doubt the correctness of the theory that an Exophoric Hypermetropic eye can be Monocularly correct, but Binocularly Myopic. Further, it demonstrates that we can, with the use of a prism base in, leave this condition greater or less as desired. The Myophoriagraph will graph these conditions, showing how the addition of plus lenses induces a greater degree of Exophoria, and how minus lenses reduce the outward movement of the eye.

Time, The Factor In Phoria.

I want to impress upon you one thing when speaking of Horizontal Phoria, that time is the factor in our study of Phoria. We have three different forms of movement or actions taking place, each presumably at a constant speed. 1st, accommodation; 2nd, convergence; 3rd, the supplementary act, which adjusts accommodation to convergence. Thus, if in Myopia three units of accommodation are required to every four units of convergence, you have a case of Exophoria, the three units of accommodation completing its work in three-quarters of the time the four units of convergence could do this work. Hence, the gain to the accommodation would be 25 per cent in time.

The convergence would require 4/3 or 33⅓ per cent. longer time than accommodation to act, so I find the discrepancies between accommodation and convergence are best expressed in time.

At all events, the instrument and its objects are more clearly demonstrated and easier to grasp from this viewpoint and I may say it helps me considerably in explaining my conclusions. As to why I adopted time. You know that when attention is drawn to an object or light, the eyes involuntarily accommodate and this action is either synchronised with, followed by, or preceded by convergence.

"The mechanism of vision" (as outlined by Dr. Peckham) "in its main essentials, without going into the finest details, is, first, the awakening or innervating impulse that automatically turns the eyeballs to their natural position of equilibrium, accompanied, of course, by the attention being captured by some object which we immediately 'look at' more closely; then version, to fix the object on either the right or left fovea, with the immediate reflex of the accommodative-convergence impulse, to produce if possible, a clear, single image; then we have a third impulse, not always necessary, but there to use if needed, a convergence re-adjustment, called 'The Supplemental Convergence,' needed for single binocular vision when the accommodative-convergence impulse has failed to bring about perfect fusion.

"Accompanying the convergence impulse is the contraction of the pupil, which is further aided by the pressure against the iris of the convexing crystalline. All these acts are normally positive, either in the first fixing of a distant object on awakening, or in turning from a distant to a near object. The crystalline lenses increase their convexity, the visual axes turn inward, the pupils contract. And in turning to a distant object after looking at

something close at hand, these acts should all be negative together, the crystalline lenses flatten, the visual axes turn towards parallelism, the pupils dilate. It is when some of these acts must be positive while others are negative that we have trouble, or when they do not work smoothly together and one lags behind the others."

The King of the Trio.

Now, in this trinity of action, each is necessary, but the key to comfort is, without doubt, supplementary convergence. Dr. Maddox speaks of the final action as "Binocularis," and states definitely that supplementary convergence is "King of the trio." It will now be seen that in Esophoria convergence represses accommodation: in Exophoria convergence stimulates accommodation—proof of which will follow. Where, however, in both Esophoria and Exophoria, accommodation and convergence are not intimately locked, it is possible to have apparent normality at distance, but disturbance is still probable at near-point or reading.

Let us define Horizontal Phoria.

Orthophoria is the binocular resultant of accommodation and convergence when both are in perfect harmony from infinity to accommodative near-point. It is, therefore, timed (or synchronized) movement of convergence and accommodation that is called Orthophoria.

Esophoria is the binocular resultant of accommodation and convergence when accommodation is in action before convergence from infinity to accommodative near-point. The supplementary act of convergence is always later than the supplementary act of accommodation. This loss of time is termed Esophoria.

Exophoria is the binocular resultant of accommodation and convergence when convergence is in action before accommodation from infinity to accommodative near-point. The supplementary act of accommodation is always later than supplementary convergence. This loss of time is termed Exophoria.

Hyperphoria, Hypophoria and Cyclophoria are compound associates of Esophoria or Exophoria and should be corrected after horizontal phoria, if found to be necessary or desirable. By this I mean that almost invariably an Esophoric eye turns up slightly as well as in, a condition which generally disappears after correcting the cause of Esophoria. The same obtains also in Exophoria. Cyclophoria is, I suspect, an associate of the horizontal phoria, producing pseudo-astigmatism.

Now we have arrived at what constitutes an horizontal phoria—the vertical phorias I propose to leave out of the present paper as covering too much in the short time at our disposal.

To illustrate my remarks I have had some charts specially printed. I would ask you to kindly follow my remarks with the aid of these charts (see figure one).

The Chart.

On the top half of the sheet I have given you a family tree style of chart, so that you can see what has to be aimed at in giving corrections. While these groups are demonstrably correct as theory, in practice they can only be looked upon as starting points. Now, however, we will give consideration to one or two important factors. First, in Esophoria you always endeavor to decrease this condition at distance, and to leave Orthophoria or, at all events, less Esophoria. The condition being corrected at distance, there is still a natural tendency to increase at reading, and here the endeavor is to leave as little as possible. If you will follow the chart you will recognize the old joke in another guise: "Give the greatest plus and the smallest minus correction," and here is the best place to explain what this means.

Repressing and Stimulating.

The natural associate of Hypermetropia is Esophoria. This is so because while the Hypermetrope is using his accommodation at distance, his convergence is not in use. In other words, accommodation is dynamic or in action, while convergence is static or repressed. Hence the strongest possible plus. But this would be quite wrong for the Hypermetrope who is Exophoric. If you will look at the chart you will see Esophoria developed, and following down the tree you will see Hypermetropia to the right hand. To the left, on the line under, you will read the word accommodation, and under accommodation it says repress—that is by plus lens. On the right we

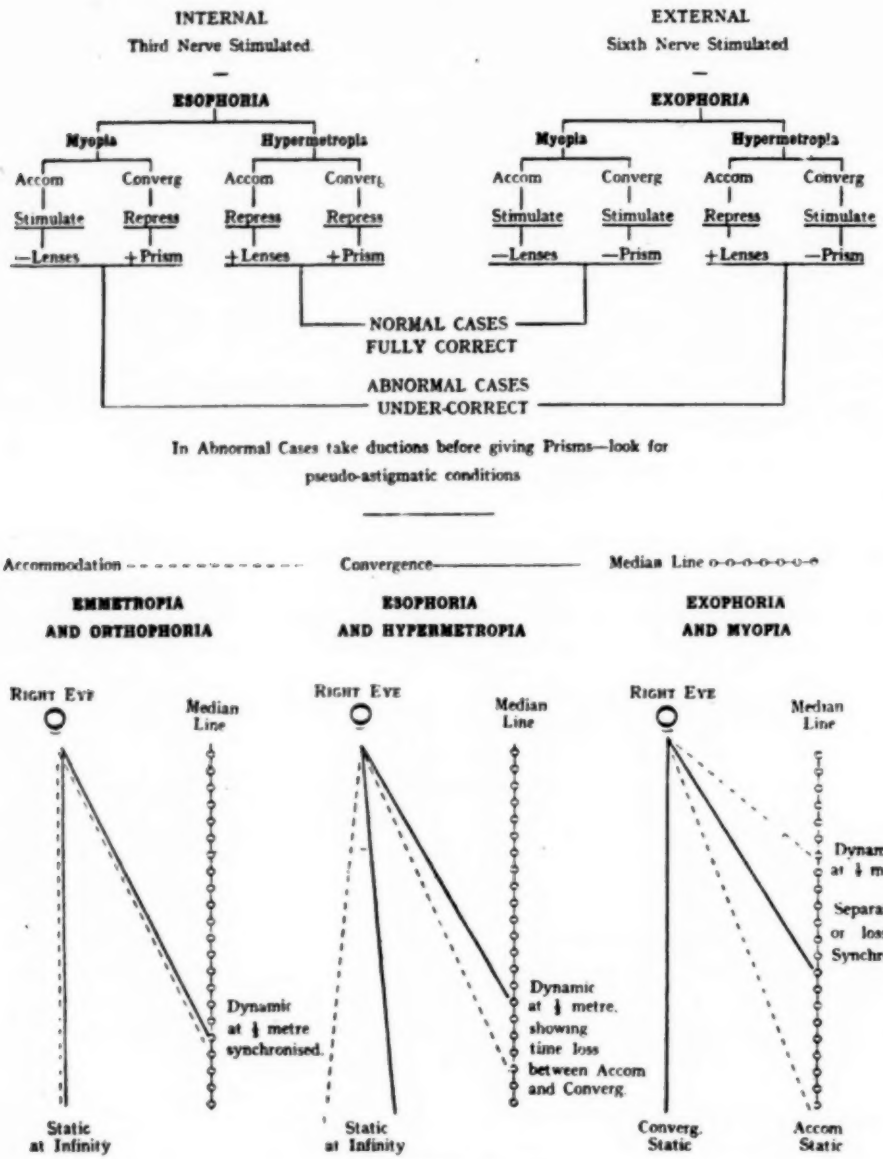

FIGURE ONE

have what is required there—repress convergence with plus prism—that is, base in.

Now, in repressing accommodation we automatically repress convergence. Unless you are uncovering latent Hypermetropia you need not use plus prism, but as soon as you do, plus prism will have to be resorted to. Here is one of the contradictions of the chart. Take Hypermetropia of low degree with high Exophoria—plus lenses are needed for accommodation and minus prisms to stimulate convergence. It is often most desirable, in order to give satisfaction to use low minus spheres and stimulate convergence through accommodation.

When convergence has been toned up or stimulated sufficiently, plus spheres will be readily accepted by the patient. But the test room operator has to consider whether he is going to give temporary comfort—say for nine to twelve months—or whether his patient is going the rounds of the various opticians in his town in search of ease, until somebody does recognize his need of the moment; because you are unable at once to unlock, without ruthlessness breaking down, a condition or habit your patient has been trained up to during a number of years.

The Abnormals.

After this example you will notice

that normal cases are in the center, and in Esophoria and Hypermetropia we have plus lens and plus prism. In Exophoria and Myopia we have minus lens and minus prism. The abnormals are Esophoria with Myopia and Exophoria with Hypermetropia. Beware of the first-named for this is the condition which produces progressive Myopia. The chart reads minus lens plus prism. In the second abnormality plus lens and minus prism are usually successful. In all abnormal cases insufficiency of accommodation may be due to the toxic effects of nasal sinus, bad teeth, etc.; so that all abnormal cases call for a duction test before deciding what course of action to take. In short, the only correct method is to "Render unto Caesar, etc.," and to keep your own side of that line I spoke of and submit your patient for pathological examination.

It is in these cases that we meet with most of the pseudo-astigmatism. Upon this question of spurious astigmatism I can, perhaps, give you a lead, by suggesting that in cases where you are unable definitely to reverse the black line of astigmatic chart; for instance, if the lines are at 90 degrees, test with a chart that has the line running in another direction, say 180 degrees. If then you are unable to render the 180 degrees line blacker than the 90 degrees line, it is quite reasonable to assume that it is a case of spurious or pseudo-astigmatism, and to give the lowest possible cylinder which gives good vision. Use a very dull light in the test room for the astigmatic test.

That is, briefly, an explanation of the chart at the top of the sheet. I shall be pleased to answer questions in further elucidation if desired.

At the bottom half of the chart appear further diagrams in which an endeavour is made to show by sketches what takes place under the three, shall we say, primary conditions of phoria.

Accommodation is shown as a dotted line, convergence as a unbroken line, and the median line is shown by the chain. I have tried to dispense with a mass of words by charting, so that a brief reference will be all that is necessary, and you will, I believe, agree with me that "time as a factor" in muscle action is quite a good choice of phrases.

It is at once evident that Orthophoria is perfectly balanced action, that in Esophoria there is a loss of time, accommodation lagging behind convergence, and that in Exophoria there is a like loss of time, convergence being the drag of accommodation. It is then simply a question of which is in action first, accommodation or convergence, and the result determines whether it must be called Esophoria or Exophoria. A very easy way to remember which defect is present, is to note the position of the prism in the trial frame. If the apex points to the nose, it is Esophoria, if to the temple, then Exophoria. It can be further simplified as "Base over weak Muscle, apex points to the defect." This is only to be relied upon when making diognosis. When prescribing, or when training prisms are given, the apex should always be placed over weak muscles to stimulate, thus making provision for a ratio, at distance, of not less than two to one by duction test for horizontal muscles. As you all know Esophoric eyes turn in and Exophoric eyes turn out.

Dr. Maddox and Research.

When, some few years ago, I first took up the question of Muscles and Phoria, there was only one book one could stand by. I refer to the work of Dr. Maddox, of Bournemouth. We all owe to him a debt of gratitude for his work towards the solution of these problems, for his was the part of the pioneer digging up facts for his lucid writings from what, it is generally admitted, was a dense maze. He was the father of our modern research on this question, and the idea of calling the prism a plus prism when it assisted by repressing convergence, and a minus prism when it stimulated convergence, showed how gifted he was in choosing these terms, and his knowledge of his subject has always been a marvel to me. I shall, I hope, if we can find one or two Exophoric Hypermetropes amongst you for demonstrations this afternoon, show how by the addition of plus prisms we reverse the Myopic shadow with the Retinoscope when binocular vision is used by a Hypermetrope who has been corrected mon-

ocularly; and how, with an Exophoric Hypermetrope this can be expressed, as our chart shows, as a plus prism or a minus lens. Also how, with the same Retinoscope, the Esophoric can have added either a minus prism or a plus lens to reverse his shadow movement.

Some Experiments.

The Maddox Rod Test was the first one I investigated. This set up questions in my mind for I could not see how these could be made optically perfect. To satisfy myself I obtained a true optical flat with a grating on it. I have this with me here, and I will show it in my demonstrations. This proved satisfactory and settled some of my doubts; but I am pleased to acknowledge that the improvement over the present Maddox Rod was infinitesimal—not worth troubling about. As it would cost something like 21s. to 25s. each to produce and add little or nothing to the efficiency of the research, I did not further consider it. The great thing to me was, that if the Maddox Rod were placed vertically in the trial frame cell it did its work nearly as well. My study of this was not wasted, however, for it proved to me that whatever direction I took from this, there was no great error in the Rod, especially when used with a cover test. So that while I could perhaps claim that my ruling was superior and an optically perfect test, it did not offer any advantage in the solution of the problems I was studying over that to be obtained by using the Rod as stated.

I have tried out the Stevens' Test of 6D. Prism Base up or down over one eye, and this at last, after much use, showed exactly the same result when used with cover test. Similar results to those of the Maddox Rod can be obtained with the red glass over one eye, and careful cover test is almost the same thing. Cobalt blue showed, if anything, more Exophoria than the others, but prolonged cover tests, as I have said, gave similar results.

A Universal Test.

I have probably covered a lot of ground up to this point which presents nothing fresh to you. Possibly you can say the same problems have been presented to you, and that you have arrived at very much the same conclusions as I did. The question I asked myself, however, was, why not test all the muscles attached to the eyes at one and the same time, and that when the accommodation is active, thus obtaining a history of the dynamic state of the eyes. At first this seemed almost beyond our grasp, a dream. I was in no doubt as to the necessity for this and I felt that the matter could not be allowed to rest here. After a number of simple and complex experiments with five and six dioptre prisms, much concentration on my part, and at the cost of some headaches on the part of some of my friends, at whose expense I was able to adopt this idea and discard that idea, I succeeded in making a chart, which I have also brought with me, very much like a clock dial. Gradually the way became clear along the lines I have indicated, and it became a rooted conviction that it was absolutely necessary to have both eyes in action if we were to obtain data showing their true value of powers as working units at the same time.

Binocular Fusion.

I now felt that I was on the track of what Dr. Maddox called "Binocularis" and what others speak of as the Supplementary Act. I adopted the term Binocular Fusion. I felt that it must be established where the loss of synchrony existed, because it is evident that it is this which causes the defect in the horizontal phoria. Further, it is also evident that all our adjustments, which are made to give clear vision, are altered finally through this supplementary act, in order to give that comfort which we are well advised to concede to every patient. Our final efforts and adjustments are all made with this idea of establishing comfort with as good vision as comfort will permit.

It was that necessity to have the eyes in action which led me to devise an instrument to give me the information I was seeking. I was not concerned with distant defects, but I did want to see what happened when all muscles—the internals and the externals—were put to work binocularly at a point for useful reading, say 40 cm. Thus, if we were able to produce on a card a permanent record of all associated muscle movements and powers—

that is the accommodation in co-operation with all the recti and oblique, I believed we should have data for future reference and, moreover, it would be possible to dissect our cases at leisure, and that our deductions would train our thoughts to do this work at our test chairs from the practice we had acquired. Such would naturally very much improve the value of the data we are all out to obtain, and I would like you to understand that what I hope for the instrument, is best expressed as the increased comfort of our patients.

When first conceived the Myophoriagraph had a most elaborate recording arrangement with a piston and plunger for graphing. I shall speak of this presently.

Patient Graphs Own Record.

Even after the instrument was in being a number of modifications were made, and, as in all instruments, there are certain limitations. I found that although it is not so good a test for a person 50 to 56 years of age, it still gave useful information 7 cm. off his reading point. For persons under this age it gave valuable information at a good working distance—one that is constantly being used.

Having at last arrived at the general idea of the instrument and having had a model prepared, it was necessary to decide the speed (or speeds) at which to rotate the prism in order to get consistent results. It had to be made as nearly fool-proof as possible, because the patient, following instructions has to graph his own record. Generally speaking these conditions are fulfilled. There are a few, however, who cannot use the instrument. The Amblyope in one eye, the person who is suffering from suspensiopia (or suspended vision in one or the other of his eyes), and alternative conditions which I can show you exist.

One of the first experiments, after the instrument was made in its present form, was in an endeavor to see what effect increased plus correction of an ordinary Presbyope would have. We knew by other methods that if reading glasses were worn it showed Exophoria in greater or lesser degree according to the increase or decrease of plus correction. Here we obtained proof of something that was accepted by all writers on phoria, because Presbyopic corrections made distance Myopic and a Myopic distance always should show Exophoric reading; seeing that the Presbyope was undoubtedly in a myopic state when correction was worn for distance.

The Retinoscope.

Now it would only weary you to tell you of a long series of tests, adjustments and all the incidentals connected with the instrument. A few moments of demonstration in your own hands, under my direction, will give you a lot of information in a much clearer way. So we will leave the Myophoriagraph for the moment, keeping just a short reference for later on, and just briefly introduce the Retinoscope.

This instrument was the further step in our research. We could obtain a graph of what had happened, we could form deductions upon that graph, so the Retinoscope was devised to try to see these things happening. Success in this latter completed the phase of research and proved that accommodation lagged behind convergence in Esophoria and in Exophoria convergence lagged behind accommodation. Further steps in this direction showed that a Myopic eye does not require the innervation as the Hypermetropic eye, therefore, not so many units of energy are called for to operate the accommodation as in the Hypermetrope for the same distance. Consequently, convergence is not stimulated so much. It is when we go further with our graph that we realize that Exophoria is a Presbyopic type of convergence.

I have had to take you along these lines, not because I have something new to tell you, but in order to explain that phase of our professional activities which led to the research, the outcome of which is both the Myophoriagraph and the Retinoscope.

Research Workers.

It is evident, is it not, that research workers are of a necessity trained observers. That it is not feasible for a busy test-room operator to devote his time and thought towards elucidating the problems that continually are presenting themselves. It is palpable, therefore, that some organization must be brought into being, to which these problems can be handed over for re-

search, if the optician is to occupy his proper position in the professional circle.

Most of you are possibly familiar with my views upon the subject of research, but I will venture to place them before you. First and foremost your Opticians' Charter depends upon this. There is an imperative call upon us to bring into being within our organization a fund to be devoted to research on visual optics, which fund shall be contributed to on a basis to be decided with a most liberal outlook. I would not myself suggest the amount to be asked for by way of contribution, but I put this point to you. 5s. per week per member is not half the errand boy's wages, but the return for such a contribution would be the services of the highest trained observers in physics to carry out your work and solve your problems. In leaving this for your further consideration, let me put this thought before you. "Can you imagine a government supporting your research by a block grant, and yet refusing you a charter?"

It should be an easy matter to devise a scheme for contributions towards this object. The qualified assistants might even participate seeing that the work waiting to be carried out is for the benefit of every man and woman in the profession. It may be difficult to ask the assistant to pay his quota, but some of you employ one, two, or even more with whom you have agreed as to salary. Is it not feasible for an employer to pay an agreed amount for each qualified man he employs, so that the full benefits of the research may be more widely enjoyed. Assistants could then pay part and have the advantages of the published results of the research work, so that, in turn, when they become employers, they hand the torch on.

I have referred briefly to the elaborateness of the original design for the Myophoriagraph. As a member of the Scientific Instrument Research Association, I placed the idea before the Director of Research (Sir Herbert Jackson) and with his kind assistance I was able, after half an hour's conference, to simplify the design and mechanism of the instrument, and the result is the form in which it at present stands. I may say that the cost was also reduced by some £30 or so. At the Conference were also present Dr. Moore (Assistant Director of Research) and Mr. Mason (of the Cambridge Instrument Co., Cambridge, and London). After the first instrument was made, with the modifications suggested, prolonged experiments were carried out on the actual Myophoriagraph here today by the Research Association, and the results more than justified the time and expenditure which had been entailed. I was soon getting a separation of the right eye object from the left, which gave me an absolute muscle test of each eye.

Utility for Air Pilots.

Quite early after the instrument had been made, it was submitted to the Air Force for consideration. The idea I had in mind was that by its means Air pilots could have their muscle balance tested for ability to fly and, most important, land safely. Technical men were charmed with the idea, but the ophthalmic surgeons claimed that they could do all that was required by the old muscle test. It availed nothing to point out that this was the first successful attempt to plot and graph the pilot's muscular balance or imbalance, and further, that, by its use, a record could be obtained and filed for future reference. They were not impressed by the fact that any departure from standards of efficiency could be detected and recorded and proof submitted, if desirable, to independent judgment. I was informed that I had very little chance of success unless the instrument had the approval of the ophthalmic surgeons. The answer to this I leave with you to connect up with my remarks on the necessity for research as a step towards obtaining the recognition we are entitled to.

Before proceeding to demonstrate let me thank you for your courteous hearing. If at times I have failed to make my meaning clear, I shall feel further indebted in being allowed to expound or elaborate in answer to your questions. I would like to again emphasize that the sole inducement for me to venture to address you on my small successes in the field of research is that I thoroughly believe there is a great future for the optician or optometrist (whichever term you prefer)

if he will only seize hold of the opportunities within reach. We are rendering a great service to our generation in our daily efforts to preserve and improve the vision of the people, giving them comfort for work and leisure and protection against the evils arising from misuse of the eyes.

The line I mentioned at the outset as lying between the physical and pathological sides of optical science is a sharp and very definite one, which not one of us desires should be broken down or bridged. Let us justify our position by every means within our power, and win for ourselves that recognition which we know we are entitled to against all and every argument to the contrary. Once again thank you for your courteous hearing.

At the close the Chairman said that having heard so much from Mr. Esdaile, he was sure they would be very anxious to see some practical demonstration with the myophoriagraph. He would therefore ask those who were interested in the demonstration to come forward as quickly as possible and view the instrument in operation. The ground covered was so large that he thought many of them would prefer to await the printed paper, and formulate their questions more in the quiet of their home influences, but if any wished to put questions Mr. Esdaile would be very pleased to answer them.

Many fresh points were elucidated by Mr. Esdaile during the course of the demonstration with both the myophoriagraph and the retinoscope, the operation of the instruments being followed with great interest.

*The Refractionist. (British) July 1st, 1926.

REPORTED CASES

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Unsymetrical Faces.

Dr. McFadden (1) reported a rather interesting case. Patient now age 77 years. When 18 months old fell from two story window, landing upon his buttocks apparently unharmed by the fall. Received a blow with stick upon left eye and edge of orbit, when 15 years of age. No Eso., or Exo., for distance, but 2 degrees of left cyclophoria and 4 degrees of left hyperphoria. His correction is O. D. +0.75 D. Sph. ⊃ +1.50 D. Cyl. Axis 95 ⊃ 1Δ Base up. O. S. —1.50 D. Sph. ⊃ +300 D. Cyl. Axis 95 ⊃ 1Δ Base down. Add O. U. +2.50 D. Sph.

The face is some 2 cm longer on the right side than on the left. The left ear is 1½ cm lower than the right. The left pupil is 2 mm lower than the right, and 1 cm farther forward requiring a shorter temple. Bifocals with 1 degree prism on each eye, segment base same as distance correction proved satisfactory, for everything except reading. For this purpose it was necessary to make a special pair of reading glasses and to increase the prisms to 6 degrees, as the left hyperphoria increased at near over the distance error. Obviously this case is a law unto itself especially as to frame fitting. Since these eyes will not fit the ordinary frame, a special frame fitted to the features was necessary. Cases of this extreme are rare, but perhaps perfect symmetrical faces are more rare, hence great care must be taken in fitting all frames.

Congenital Cataracts.

Dr. Fulton (2) reported a case of a young lady, age 17, found several years ago in making an examination at the school of the blind at Faribault. He found she had congenital cataract in both eyes. The opacification of both crystalline lens being complete. The cataracts were successfully removed, with excellent acuteness of sight. Two years later a young man was admitted to the same school having lost one eye by trauma, and the other eye by sympathetic Ophthalmia. The two fell in love and wanted to get married. The young lady inquired if there would be any danger in bringing forth blind children. She knew her family history well, and there were no cases of blind-

ness on either side of her family for several generations back. Dr. Fulton said he did not think heredity was to be considered in the case of her prospective husband, who had lost his vision as a result of an injury, so he told the young lady that he did not think there was any danger of producing blind children. Two children were born as a result of this marriage, both with totally developed congenital cataracts. Both husband and wife were unusually well developed physically.

The writer calls to mind a similar case, some two years ago he was giving muscular treatments for weak convergence to a young married couple. Both cases were alike, and both responded equally well to treatments. Some seven months after a child was born to this couple with congenital cataracts of both eyes. About 80% fully developed. This child now is about 18 months old, carries its head far up and back when it attempts to see anything. Parents both in splendid physical and mental condition. Physician and Ophthalmologist are at sea as to the cause of this condition. It has been a question in our minds as to the possibility of this being a mental or physical heredity condition. There is so much unknown to us as yet about the eyes.

Muscular Imbalance as a Cause of Astigmatism.

Dr. Tuck (3) in studying this condition was of the opinion that most cases of Astigmatism are caused by muscular action or imbalance and would present a cylinder correction with axes against the rule, so he conceived the idea of making a survey to prove or disapprove this point. Tabulation of 1147 cases resulted as follows:

Cases with no Astigmatism 131 or 11.42%.

Oblique axes 83 or 7.23%.

Horizontal axes with rule 509 or 44.38%.

Vertical axes against rule 424 or 36.97%; before tabulating these figures Dr. Tuck says he expected this survey to show a greater difference between horizontal and vertical axis. According to different ages, taking 34 years as the dividing line, he found axis with the rule or horizontal in 50% of the cases under the age of 34, as compared to 38.20% in those cases above the age of 34 years. He found axis against the rule or vertical in 34.67% of the cases under the age of 34, showing that as accommodation diminishes astigmatism against the rule increases. But Dr. Tuck says that he is forced to admit that the muscle condition as influenced by age does not have as great an effect on astigmatism, created on its axes, as does the true muscle anomaly, which must be treated as a muscle imbalance alone.

Juvenile Glaucoma.

Dr. Zentmayer (4) reported case of Glaucoma in a male, age 20 years, who stated that his vision had been good until about three weeks before date of examination. This statement however is doubted. He had pain in right temporal region at times, and occasional halos. His father had bilateral glaucoma, for which an operation was done. Right pupil was dilated to 9m.m., but was active, the rest of the media was clear, the cup was exceedingly deep with narrow halo about the disc. Veins were engorged. Left pupil is 2½ m.m. Vision O. D. 3/60 O. S. 6/15. Wassermann test negative There was however an acute ethmoiditis and diseased tonsils. There are some who believe that in cases of glaucoma in the young, it is probably of a secondary nature, but this does not seem logical. And this type of glaucoma particularly is likely to be hereditary. There is a possibility, however, that the general circulatory condition may be improved by removing the nasal and tonsillar foci of the infection. Cases of this type are not to be delayed by Optometric treatment, but many cases of blindness may be saved by referring the case at once to a competent Ophthalmologist.

Temporary Blindness From Poison Whiskey.

The writer (5) reports, man age 42, because of extreme sudden blur of vision, consulted him. History of drinking almost a pint of whiskey, on Wednesday evening, did not remember what time he retired, but on awakening next morning, could not see to distinguish faces. Everything was a blurred mass, could not tell a chair from a table across the room. Very

little pain in eyes, some frontal, brow headache. Vision in either eye was fingers only at 2 feet, and that was not certain. Pupils slightly dilated, fundus and media clear, except both discs had a marked whitish, yellow appearance, and was somewhat swollen. Case was referred to a competent Ophthalmologist who instituted elimination treatment, through bowels, kidneys and skin. After 5 weeks' treatment, this case was referred back to us for glasses. With plus .50 Sph. O. U., vision was improved from 20/30 to 20/20 O. U., with this correction he was able to read the smallest print on the test card. Needless to say, this man is very happy, and is now a law abiding citizen as far as the Volstead Act is concerned.

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PRACTICAL NOTES AND CURRENT REFRACTIVE TOPICS

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THE SIZE OF THE PUPIL IN MYOPIA

A large pupil is characteristic of myopia, but just why this is so, no one has satisfactorily explained. If myopia is due to increased convexity of the crystalline, as those who talk of "Spasm of the Accommodation" maintain, then the pupil ought to be small. If myopia is due to synergistic innervation of convergence and accommodation, where there is high structural exophoria with low structural hyperopia, then, too, the pupil ought to be small, for there is ample evidence that pupillary contraction is an associate of convergence activity.

A case of myopia which I have been handling for six years, presents a peculiar aspect, which is not illuminating for it cannot be explained. I present it, hoping that some one can find the explanation.

When I first saw the child, she was myopic about 1.50 dioptres. She wore these glasses a little over a year and returned because she could no longer see well. Gave her O. U. —2.00 D. Sph. Six months later she needed O. D. —2.50 D. Sph.; O. S. —3.00 D. Sph. Six months later she took O. D. —3.00 D. Sph.; O. S. —4.00 D. Sph. This was about the time that I first began giving bifocals and plus prisms to myopes, so I gave her a degree prism base in, on the distant left lens and added O. U. +1.00 D. Sph. for reading. But in another year, she was back with a still further increase of myopia, and, worse than that, vision could not be brought up to 20/XX. She began to complain of pain in her eyes.

The myopia had now increased to —3.75 dioptres in right eye and —5.00 dioptres in the left. With a 2 degree prism base in over right eye and a 3 degree prism base in over left, I was able to keep the correction down to the former —3.00 D. Sph. and —4.00 D. Sph. for right and left eyes, respectively. Vision in right eye could not be made better than 20/XXX and the left eye had fallen off to 20/XL. The +1.00 D. Sph. addition for reading was retained.

With the advance of the myopia, the pupillary opening had increased regularly, until now but the barest margin of the iris could be seen. Reaction to bright light was very slight.

These glasses were worn for eighteen months, with fairly good comfort, when occasional pains began to be felt, particularly in the left eye. On

examination, I found that the myopia had progressed no further, nor had it decreased. Without controlling prisms, the right eye required —3.75 D. Sph., the left eye —5.00 D. Sph. With the prisms, 2 degree base in, for the right eye, 3 degrees base in, for the left, the correction reduced to —3.00 D. Sph., and —4.00 D. Sph. as formerly. Vision was somewhat better, 20/XXV in right eye, 20/XXXV in left. The pupils were just a trifle smaller and the reaction to light much better.

Distance abduction was 9 P. D., 5 degrees base in over left eye, and 4 degrees over the right. With this amount of prism and the old correction, vision came up to 20/XX, a little time being necessary for deciphering all the letters. Although this was the extreme limit of abduction, I determined to make the attempt at having the full prism amount worn. The lenses were made up. When first put on, she had double vision. In about five minutes the images directly in front fused, but diplopia occurred if the eyes were turned to right or left. In half an hour, the area of possible version without diplopia widened sufficiently to make it safe for her to go home. The next day she reported that this difficulty of versions had practically disappeared, a couple of days later normal versions without diplopia were possible. On the first day, the pupillary diameter reduced slightly, on succeeding days, it grew less and less, in a week was down to four millemeters.

With this amount of prism, no addition was needed for reading. And this I have noted many times in the treatment of myopes. If enough prism can be tolerated to make that pair of eyes into a normal functioning pair of eyes, the bifocal can be dispensed with.

These glasses have been worn for a year. An examination a few days ago showed vision in both eyes as 20/XX, good. But the important point is the absolutely normal functioning of the pupils. They contract and dilate with changes of accommodation and convergence, with changes in light, just as do non-myopic eyes.

TERMINOLOGY

The terms Exophoria, Orthophoria, Esophoria, are relative only, frequently give an entirely false impression of conditions. We may find what we call a condition of orthophoria, that is, with vertical displacing prisms, or with the Wing Test, or with the Maddox Rod, we find the two images are in vertical alignment. Accordingly, we think all is well. But that person may have a high degree of hyperopic error and an equally high amount of structural exophoria, and he may use his convergence to force the accommodation into compensation of the hyperopia. Now that person is under the same strain, only varying in degree, as the one we call an esophore. And, constructively, he is an esophore.

We may find a manifest exophoria. But behind that there may be a high latent exophoria and a high latent hyperopia, and in compensating, that person uses just as much effort as does he whom we find to be an esophore in the routine tests. Constructively, measured in terms of stress, that exophoric person is an esophore.

Again, we may find an exophoria, and there may be no latent error. That person merely uses convergence and accommodation as separate functions, there is no imbalance and no stress. If by orthophoria, we mean freedom from stress, constructively that exophore is orthophoric.

We ought to have some terms by which we could distinguish between these cases of stress and non-stress. These terms were coined before much was known of ocular mechanism, when any departure from alignment was considered a "muscular imbalance," and alignment was considered as a perfect situation. Today, we know better. We know that "orthophoria" is no proof of the absence of latent hyperopia nor of convergence sufficiency; that in exophoria, any stress is not due to the manifest exophoria but to either a latent hyperopia or to true convergence insufficiency; that "exophoria" is not synonymous with "convergence insufficiency"; that convergence insufficiency is not a muscular anomaly but an arrested development of the pathway through the medial longitudinal fascisculus.

All in all, the terminology is unsatisfactory in the extreme. The words do not say what we wish to convey, or

if we use them with our own mental interpretation, our auditors may be using with them with their definitions of 1860 or thereabout. We really do need a new stock of terms.

TONICITY

The writer has always felt that it was a case of malapropism to call the phoria test a "Tonicity Test." Of course, this word was applied a good many years ago, when much less was known of the mechanism of ocular functions than at present, and when absolutely nothing was known of muscular "Tonus," although the word was batted about as freely as though the users knew what they were talking about.

By the Savage method of making the phoria test, prism base down over one eye, base up over the other, we should learn how far convergence and accommodation travel together. If the two images appear in exact vertical alignment, we know that convergence carries accommodation up to the point of intersection of the visual lines, and that if there is still some hyperopic error manifest, the accommodation must care for that without convergence assistance. If we find an esophoria, we know that convergence has been called on to carry accommodation to the point of retinal focus, or as near to that point as possible. And if we find an exophoria, we know that convergence and accommodation are not closely associated, that they travel together part way, and the balance of the journey is made by each with its own resources.

But occasionally we find an exophoria that disappears when we put on plus to correct the manifest hyperopia. Then that exophoria must be due to exhaustion, but whether that exhaustion is muscular, due to low nervous conductivity, or to exhaustion in the cells of nerve origin, we do not know. It is possible that it might be due to all three.

Again, and these are quite common cases, the patient will say that either the upper or lower image "wobbles," it moves back and forth, it may for a moment show esophoria, then come back to vertical alignment, then back to esophoria, possibly may then slide over to the exophoria side. Or there may be vertical alignment at first, then the upper or lower image slides off into exophoria. Or there may be a low exophoria at first, which in moment becomes greater.

It may be possible that this inability of the images to remain in a fixed position is due to low muscular tonicity. I am more inclined to think that it is nervous exhaustion, and not exhaustion of that part of the nervous system which has to do with "tonicity" but of that part that has to do with muscular innervation. Still, it may be either, or it may be both.

At present, I can think of no means of testing the tonicity of the ocular muscles. The ductions do not test this, their purpose is to show how far the central nervous system can be forced to supply convergence or to relax convergence. If atropine could be relied on to fully relax the accommodation and separate it entirely from convergence influence, then a phoria test might show the tonic position, but still we would have to learn the anatomical structure and compare the anatomical with the tonic position. We have no "knee-jerk" reflex that we can apply to eyes.

It would seem better to drop the words "Tonicity Test," for the present at least, until we have enough knowledge of muscular "Tonus" to invent such a test. As physiologists disagree on "tonicity" and "tonus," we can hardly hope for the day of an ocular muscle tonicity test to appear very soon.

OPTOMETRIC NOTES

THE DOMINANT EYE

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In the August issue of this Journal, page 249 Dr. Joseph I. Pascal writes interestingly with respect to the division and application of prism powers over the dominant and non-dominant eyes. His conclusions are very sensible with respect to not dividing equally such power as is indicated, but applying unequal powers in proportion to dominancy and other factors. His method of determining dominancy by means of a pencil or finger, in one method, or by a red disk, has some inherent disadvantages which are too closely allied with right and left-handedness to permit of proper accuracy. If either test is applied, handing pencil or disk to the consultant, they will invariably accept the article with their dominant hand which has nothing whatever to do with the dominant eye, of course, but will hold up the article in the more convenient manner.

For years the writer has followed the practice of handing the consultant an object with instructions to use both hands holding it. This practically obviates any tendency to hand-dominance in a careful test for eye-dominance. Instead of using pencil or finger it is better to use a card a few inches square and with a 1 cm hole in its center. Instruct the consultant to receive this card with both hands, with both arms extended as far as possible, and when so extended (and never until thus received and extended) is he instructed what to do next. This act is that of looking through the hole at the spot-light. The refractionist can then instantly determine which eye is used. Repeat the test two or three times without letting consultant know what it is about, for the less they mix their personalities and beliefs in the test the better for the refractionist.

Leaving out the personal beliefs and judgments is very essential in objective examinations and we should carry this part as far as possible. For this reason opinions of their judgment by looking alternately through the red disk often leads to error. Very few people have close discriminatory judgment anyhow, particularly with respect to things outside their vocation.

Another factor which largely precludes the value of the chromatic test for eye-dominance is that of suspenopsia, the alternating suspension of vision, something which is very common. Often the intervals are of several seconds' duration in one or the other eye. Sometimes the suspension is momentary with long intervals of "on," but often the "off" intervals are the longer, or equally as long. Moreover in some individuals there is about equal off and on intervals of each eye, while in other cases one eye will have very marked lazy characteristics. Strangely enough, however, an eye having the greater number of suspensions per minute, or the longer intervals of suspension, may still be the dominant one. Many very careful tests extending over several years have proved this true. Therefore the card test for dominance is more accurate than the chromatic test wherein suspenopsia may inadvertently introduce miscalculation.

When prisms are introduced into prescriptions, particularly v e r t i c a l prism power, dominance tests are extremely important, and far less disturbance in calculations of height of floor, side-walk, curb, and other objects will be caused if either all the prism power or its major portion at least, is placed before the non-dominant eye. There is no more sense in placing equi-powered vertical prisms before a pair of eyes than there would be in dividing equally for monocular eso or exo-phoria. Man is prone to follow tradition rather than common sense.

ABSTRACT DEPARTMENT

Optometric and ophthalmic Journal articles and reprints to be abstracted should be sent to Dr. G. L. DuPlessis, 209 Yeates Building, Minneapolis, Minnesota. Only papers of interest to optometrists will be reviewed in this department.

Detection of Malingerers. E. Tork. Archives of Ophthalmology. Vol. LV, No. 4, pp. 338-350, 1926.

Tork finds it too easy at times to pronounce a patient a malingerer when in reality the underlying cause of the visual defect may not be at all apparent. His industrial eye work leads him to say that the majority of patients are honest and that one should be very reluctant in pronouncing a patient a malingerer. He cites the following case as an example of the mistakes one can easily make in this direction:

"A young man, 19 years of age, came to me on April 23, 1925, stating that the day before while working something flew into his eye but fell out again of its own accord; he complained of pain and irritation in the eye. The right (uninjured) eye was normal with 20/20 vision. The left (injured) eye showed a slight, mostly conjunctival irritation, but was otherwise normal. There was no foreign body in the eye neither was there any defect in the corneal epithelium. The vision was 20/30, the refraction moderate hyperopic astigmatism. He continued at work. The congestion of the left eye disappeared within two or three days but he constantly complained that his eye was getting worse and finally on May 1st, he declared that he was going to stop work. Examination on this day revealed 20/100 vision; under homatropine he shadowed a moderate hyperopic astigmatism after the correction of which 20/70 vision could be obtained; the media were clear; the fundus showed no pathological change. On May the fifth, he returned again stating that he had stopped working and that his eye felt much worse. I again examined him under homatropine and found everything including the fundus perfectly normal.

"Basing my diagnosis on these findings and also upon the apparently unfounded complaints of the eye steadily growing worse, together with the sudden and inexplicable drop of visual acuity, I decided that he was a malingerer, but asked him to return in three or four days again. He returned on May the ninth at which time the fundus examination again revealed a normal fundus, but the field, which was taken for the first time on this date, showed a central scotoma extending upwards and nasally from the point of fixation. He was now admitted to the hospital and the usual routine examination was made but everything was negative. Under mercury rubs and pilocarpine sweats the eye slowly improved so that on June 3rd his vision was 20/70 and on June 17th 20/50. All during this time the fundus showed no pathological changes and the scotoma remained about the same. Diagnosis at this time was acute retrobulbar neuritis.

"I did not see him again until July 27th, 1925, at which time he had a marked central choroiditis with several recent patches, one of which was pigmented. At this time he showed me a report of an examination made by another specialist on July 5, 1925, who described having found yellowish patches at the macula but no pigmentation."

T. O. B.

Total Color Blindness, by **Vogt,** from the **Progress of Ophthalmology.** Edited by **M. L. Foster.** Archives of Ophthalmology. Vol. LV, No. 2, p. 192, 1926.

Foster quotes Vogt who believes total color blindness to be not so rare as has been thought. He found three cases among 4,000 school children in Basle, each of which had been fitted to glasses without discovery of the color defect.

T. O. B.

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OPTOMETRIC NUMBERS

The subject of raising educational requirements for the optometric profession has received considerable discussion. There are those who think that the requirements should be raised way above the present standards, and there are others who question the wisdom of such action. The argument advanced by this latter group is that fewer men will enter the practice of optometry should the educational requirements be raised. Very much stress is being laid upon the importance of having a large number of men enter the field of optometry, for it is claimed by some that the survival of the profession, its future progress and recognition depend upon its numerical strength.

It may be well to analyze the validity of these claims. If we should turn to review the history of other professions we will find that each time their educational requirements have been raised the number of men entering these professions during the next few years was considerably reduced. The falling off in numbers was particularly noticed during the first few years after the new requirements became effective. After that time the number of students entering the profession increased until it reached, and in some cases even exceeded the former level. It is a well known fact that history repeats itself. What history has proven to be true with other professions will also be true with optometry. If we should, for the sake of argument, grant that less men would enter the practice of optometry under advanced standards would that necessarily prove to be a determent to the profession? Not at all. That the profession has made considerable progress within the last few years is a fact agreed to by all, yet it is during this period of time that the falling off of the number of men entering the profession has been noted.

Again it may be asked in what respect would greater numbers be more helpful. It is true that for legislative purposes numbers are sometimes an asset, because a legislator or a governor will be more likely to give favorable consideration to legislation fostered by large organization than by small. But optometric organizations as well as any other professional organization can never grow so strong in membership as to have any decided influence in the results of the election. For instance let us take New York state as an example. What influence can the optometric vote of 1,637 (this is the number of registered optometrists in that state at present) have in electing the governor for whose office several million votes are cast. Legis-

lators give more consideration to the influence and standing of a professional group than to their numbers.

It has been stated on good authority that during the last session of the West Virginia Legislature the Optometric Association of that state tried to have some revisions made in the optometry law. The amendments presented by the Association have been passed back and forth from one committee to another without making any progress. Hope for their passage was almost given up by the members of the legislative committee. Finally, just a few days before the legislature adjourned some members of the West Virginia Academy of Optometry were called in by the committee which had the optometric legislation under consideration. The amendments were rewritten embodying the suggestions made by the few Academy members and were passed in that form by the legislature before it adjourned. Here again we see that the New Optometry Law in West Virginia was drafted and passed on behalf of a few men (the West Virginia Academy of Optometry has only about ten members). Numbers certainly were not given any consideration in this case.

If Optometry's recognition and survival are dependent on QUANTITY and not QUALITY, as is claimed in some quarters then optometry has lost its chance to gain recognition, because it is doubtful if there will ever again be so many registered optometrists as there has been in the past. There have been until recently over 20,000 optometrists registered in the United States (there are only about 18,000 registered now). Did that QUANTITY bring recognition to Optometry? Far from it. As far as survival is concerned and the effect numbers have upon it an analysis of some figures we have on the subject may prove interesting. While the figures represent the study of only one state still it is safe to assume that condition in other states are not different.

There were 552 registered optometrists in this particular state in 1925. Of that number 220 are practicing and are members of the state association, 60 are practicing and do not belong to the state association, 70 are practicing part time and in such manner that their membership in the association is not desirable, 108 are not practicing and 101 are out of the state. At least half of those who moved away are not practicing. Adding this number of 51 to the 108 who are not practicing as stated above, we get a total of 158 or 28.4 per cent of all men registered in this particular state who are not practicing. Now if we consider that there are 70 or 13 per cent whose practice is of such character that the profession would be better off if they were completely out of practice, and if we add this group to the number that are actually out the total of those not practicing would be raised to 41 per cent. When one considers that somewhere between 28.4% and 41% of all registered optometrists are either not practicing or not practicing in a proper manner then the claim that optometry needs numbers in order to survive does not hold true, because the facts prove otherwise.

The argument may also be advanced that it would not be fair to raise the requirements for optometrists while there are men from other professions practicing optometry without an examination or an adequate preparation, but in reply it may be said that the higher our own standards will be raised the sooner will the "special privileged group" be eliminated. Not by legislative laws necessarily, but by the law of the survival of the fittest!! It has accomplished that for other professions and will do the same for Optometry.

Let QUALITY and not QUANTITY be our aim. Let us continually aim to raise the optometric standards to a higher degree and as rapidly as practical.

J. I. K.

OPTOMETRIC EDUCATION

A number of agencies are at work to advance optometric education. University courses have been established within recent years, which offer greater opportunities than ever before to the young men who decide to make optometry their calling. Post Graduate courses and clinics are being offered to the practising optometrists. Just recently the Baltimore Optometric Club announced the establishment of the Dr. B. Woodard Hazell Award with the aim to encourage the study of Hypermetropia and its correction from an optometric stand point. And as we go to press announcement reaches us that the Eyesight Survey and Service Corporation is actively entering the educational field offering a special course of thirty-six lessons, which will prepare the practicing optometrists to make industrial and school eyesight and illumination surveys.

The personall of instructors is made up of Drs. Howard C. Doane of Boston; Gordon Gliddon of Dartmouth College; Dean Ernest Petry of the Rochester School of Optometry; Ralph Dublin and W. E. Tait, Visual Survey experts. Dr. Francis P. Barr nationally known lecturer is president of the organization.

Optometrists are urged to support in every way possible all the agencies, which aim to advance optometric education.

J. I. K.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

STATE EDITORS

E. B. ALEXANDER, Oklahoma
A. S. ANDERSON, North Dakota
J. F. ANDREAE, Maryland
D. A. KINNEY, Iowa
J. A. LARGE, Minnesota
C. A. PERRIGO, Nebraska
L. P. FOLSOM, Vermont

Reports of Society Proceedings in Iowa should be sent to Dr. D. A. Kinney, Charles City; in Maryland to Dr. J. F. Andreae, Baltimore; in Minnesota to Dr. J. A. Large, Winona; in Nebraska to Dr. C. A. Perrigo, Freemont; in North Dakota to Dr. A. S Anderson, Williston; in Oklahoma to Dr. E. B. Alexander, Duncan, and in Vermont to Dr. L. P. Folsom, So. Royalton.

A. O. A., TRUTH-IN-PRINT COMMITTEE

Instead of the appointment of the Truth-in-Print Committee by the President, the Board of Trustees of the American Optometric Association have established a department known as the Truth-in-Print Department, Dr. Arthur Hoare, 1100 Wright and Callender Building, Los Angeles, California, was named director of the department.

His assistants are:

Dr. H. E. Goodman, 701 Pacific Mutual Bldg., Los Angeles, California.

Dr. Thos. McBurnie, 1215 Bedford Avenue, Brooklyn, New York.

Any matters, properly coming under the heading of Truth-in-Print, should be sent to one of the three above named members of the department.

NORTH DAKOTA CONVENTION

The twenty-fourth annual convention of the North Dakota Optometric Association was held in Grand Forks, August 2-3, 1926.

Dr. H. S. McClung of Regina, Saskatchewan, who is a certified clinician of the American Optometric Association, was featured in the educational work. In addition to the regular clinic routine demonstration Dr. McClung gave two lectures, "Binocular Balance" and "Subjective Skiascopy."

At the business session the following resolution was passed endorsing the present administration of the American Optometric Association.

A Resolution.

WHEREAS, the present officials of the American Optometric Association have been subject to widespread criticism of an adverse nature, and

WHEREAS, There is danger to organized Optometry and its professional advancement being impaired, and

WHEREAS, The delegated body of the A. O. A., in whose composite judgment as representative optometrists we have the utmust confidence, have placed their stamp of approval on the present administration by re-electing all the officers, and

THEREFORE BE IT RESOLVED, That we, the North Dakota Optometrists here assembled, do wish to express ourselves and go on record as heartily endorsing the present administration of the A. O. A. and assuring them of our earnest support in building a strong national organization to the end that progress in the profession of Optometry be not retarded.

The legislative committee reported that progress had been made in drafting the new

optometry law and that it would be introduced at the next session of the legislature. It is designed to make illegal the sale of all glasses (other than sun or protection glasses) except by those legally qualified to prescribe glasses.

Dr. L. J. Anderson of Grand Forks succeeded Dr. D. D. Sullivan as president.

Dr. Lyle Benson of Minot succeeded Dr. L. J. Anderson as first vice-president.

Dr. L. H. Branchaud of Cavalier succeeded Dr. R. McLaughlin of Hope as second vice-president.

Dr. A. S. Anderson of Williston and Dr. E. A. Roton of Grand Forks succeeded themselves as secretary and treasurer, respectively.

Among the entertainment features on the program was an optometric golf tournament at the Grand Forks Country Club and the annual banquet at the Hotel Dacotah.

PENNSYLVANIA CONVENTION

The Thirtieth Annual Convention of the Pennsylvania Optometric Association will be held in Philadelphia on September 12 to 15.

This is expected to be more than a mere convention. It will be optometry's contribution to the celebration of the One Hundred Fiftieth Anniversary of American Independence.

The Arrangement Committee is providing a program that will be in keeping with the importance of the occasion. All features, educational, clinical and the entertainment will claim the committee, surpass anything ever presented at an Optometric Convention.

DEPARTMENT OF PUBLIC INFORMATION, A. O. A.

Dr. Geo. J. Erskine, 304 Waldheim Bldg., Kansas City, Mo., Director of the Department of Public Information of the A. O. A., urges members of our National Association to use material which is furnished at about cost to them. This material consists of Record Cards, Reading and Phorometer Cards, and various forms of well written publicity matter, such as radio talks, reader insert material for newspapers and some nicely gotten up leaflets whiche are particularly adaptable for association work at State Fairs, Auto Shows, etc. Members of the A. O. A., so interested, should write to Dr. Erskine for full particulars.

VERMONT STATE BOARD EXAMINATION

Drs. Walter Spear of Derry, N. H. and Morgan Levine of New Bedford, Mass., have passed the examination given recently by the Vermont State of Optometry. Dr. Levine is locating with C. T. Brown of Rutland.

The State Board also announces that a number of complaints have been received regarding the use of eye testing machines in connection with the sale of glasses by non-registered persons. Plans are being laid by the Board to prosecute all the law violators and all registered optometrists in State of Vermont are urged to report all the law violators to the Secretary of the Board as soon as possible.

The certificates of E. C. Parmenter, Jr., of Belmont, Vermont, and Arthur Eidelman of Roanoke, Virginia, have recently been revoked.

MAINE STATE BOARD EXAMINATIONS.

The following passed the recent examination of the Maine State Board of Optometry: Drs. William F. Leavitt, Augusta, Me.; Philip M. Deane, 71 Linden St., Everett, Mass.; Chas. W. Holden, 21 Granville Ave., Malden, Mass.; Morris L. Fireman, 15 Pearl St., Portland, Me.; Walter E. Jones, 46 Silver St., Waterville, Me.

NOKROME BIFOCALS.

The American Optical Company announces a new color-free, fused Bifocal—the Wellsworth Nokrome. As its name implies, it is free from chromatic aberration, or color fringes. Yet it retains the characteristic segment invisibility common to other fused Bifocals.

The special glass used for the button of this patented Nokrome Bifocal has the high refractive index of flint glass and the low dispersive power of ophthalmic crown glass. Due to these unusual properties, Nokrome Bifocals are free from color.

Several suggestions have been made as to how the efficiency of the Nokrome Bifocal may be tested. A very simple operation is to hold an ordinary Bifocal and a Nokrome over a sheet of white paper, allowing the sun to pass through each. Note the absence of any color fringes about the reading portion of the Nokrome shadow as contrasted to the shadow of the ordinary fused Bifocal.

A Nokrome Bifocal is also being announced by the Bausch and Lomb Optical Company, however, the American Optical Company claims to be the first to hold a patent on this type of bifocal.

ANNOUNCEMENT
TO THE OPTOMETRIC PROFESSION

The Eyesight Survey and Service Corporation chartered under the Laws of the State of New York with the consent of the Commissioner of Education of New York State herewith announce their awaited course of training in visual survey work. The course covers all branches of the work and will furnish the practical experience of the best trained practitioners in the field. During the coming month of September registration for this course may be made.

The course will consist of thirty-six lessons, coming to you six per month, starting October first. These lessons are to train men and women, in the profession, to do Eyesight Survey and Service work. These lessons have been prepared by:

HOWARD C. DOANE, Chairman of National Committee on Visual Survey in Motordom, who has been working in conjunction with Hoover Committees.

ERNEST PETRY, Dean of Rochester School of Optometry.

GORDON GLIDDON, Ph.D., of Dartmouth College, Teacher, Lecturer and Writer.

W. E. TAIT, Practitioner and Visual Efficiency Expert in Industry.

RALPH DUBLIN, Practitioner, Teacher and Visual Efficiency Expert in Industry and Commerce.

F. P. BARR, Teacher, Lecturer and Clinician.

The material furnished in these lessons is so compiled that you may easily and readily apply it. It so **directs, standardizes** and **systematizes** your knowledge so as to make it directly applicable to Eyesight Survey and Service work Commerce, Industry and Transportation are awaiting your competency in this field.

Our Service Department will provide an abundance of work for those who become efficient.

Did you receive, through the mail, our announcement? If not, write us.

Eyesight Survey and Service Corporation

1014-1019 Union Trust Building

Rochester, N. Y.